

Dental Mercury at the Northeast Ohio Regional Sewer District

Keith J. Linn

NEORSD Environmental Specialist

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Northeast Ohio Regional Sewer District (NEORS)

- Serves most of Greater Cleveland.
- Board of Trustees appointed by City, County, and suburban governments.
- Funded by local sewer use charges.
- Owns and operates CSO facilities, major intercepting sewers, and three wastewater treatment plants.
- Pretreatment control authority

1997

- Ohio EPA revises Ohio water quality rules to be consistent with U.S. EPA's 1995 Great Lakes Water Quality Guidance.
- Rules apply to the entire Lake Erie drainage basin in Ohio.

Mercury

- One of 22 Bioaccumulative Chemicals of Concern
- Water quality criteria for protection of human health = **3.1 ng/L**
fish-eating wildlife = **1.3 ng/L**

1999

- U.S. EPA adopts Method 1631 that can detect mercury levels in water as low as 0.2 ng/L.
- Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence
- Use of method shows mercury exceeding 1.3 ng/L in 98% of treated wastewater samples.

Ohio EPA Economic Impact Assessment

- End-of-pipe removal of mercury to less than 12 ng/L would cost “\$10 to \$100 million per pound of mercury removed.”
- “... would result in substantial and widespread social and economic impact.”

Ohio Mercury Variance

- May be granted by Ohio EPA to a permitted discharger if specified conditions are met.
- A discharger with the variance must develop and implement a Pollutant Minimization Program for mercury.

2000

- NEORSD's NPDES permits renewed by Ohio EPA.
- Local pretreatment limits are required to prevent mercury pass-through at the NEORSD Southerly treatment plant from exceeding 1.3 ng/L.

Numeric Local Pretreatment Limit for Mercury

- All mercury allowable into the treatment plant is allocated to domestic/background sources.
- The NEORSD-calculated numeric local limit for commercial/industrial sources is *less than zero*.

2000 Ohio EPA Pretreatment Guidance

- *The Use of Best Management Practices (BMPs) as Industrial Local Pretreatment Limits*
- “... local limits ... may be numeric or narrative ...”

2002 NEORSD Narrative

Local Limit for Mercury:

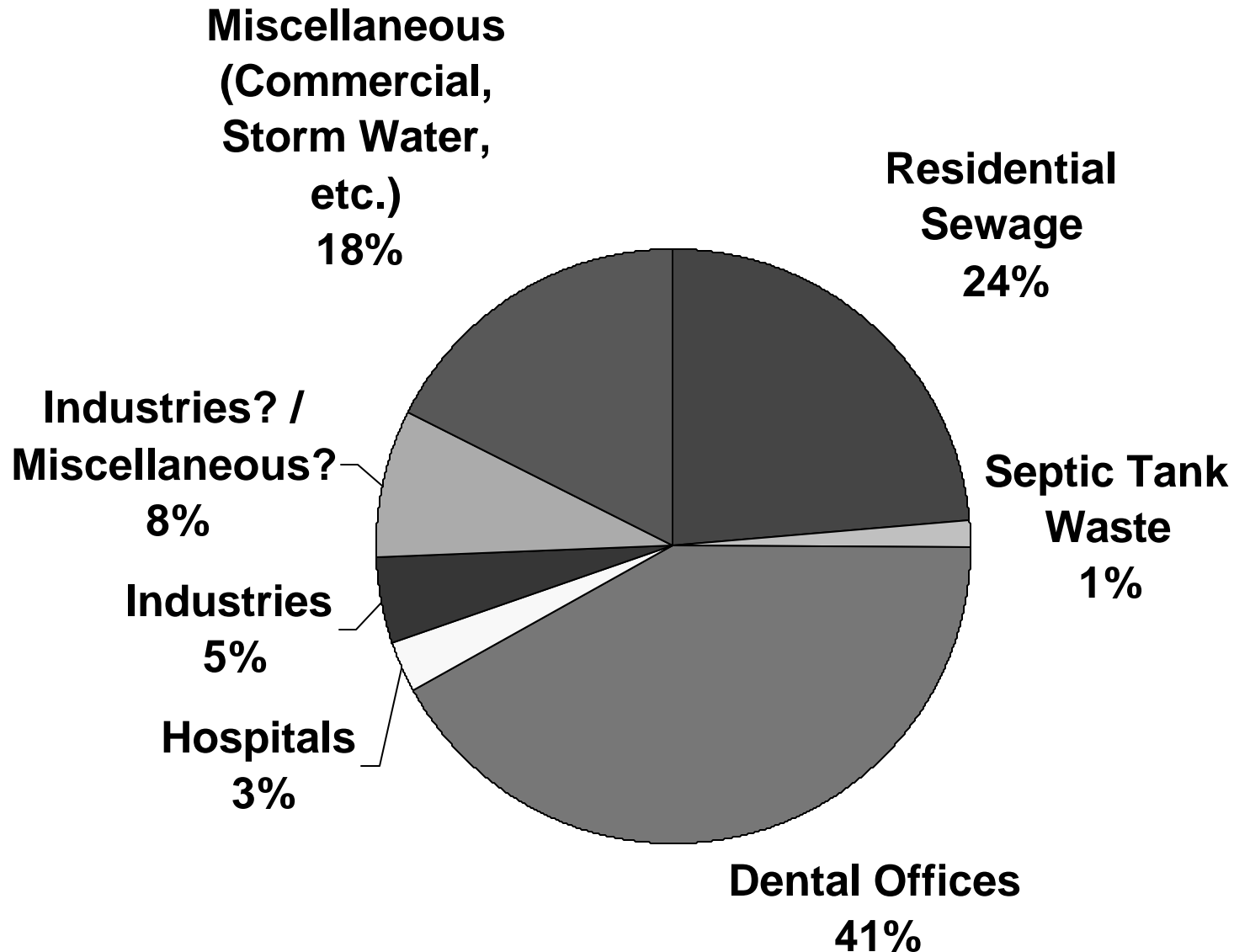
“All industrial [*i.e.*, non-residential] users that are sources of mercury shall implement best management practices (BMPs) ... to minimize discharges of mercury to the System.”

2002 NEORSD Narrative

Local Limit for Mercury:

“Certain industrial users and/or classes of industrial users identified by the District as significant ... shall comply with District-issued administrative orders requiring submittal and implementation of BMP plans ...”

NEORSD Mercury Source Estimates



NEORSD Administrative Orders

- Sent certified mail to 1,100 service area dentists by April 1, 2002.
- Require BMP plan submittal and implementation at each office no later than December 31, 2002.
- Include lists of both *mandatory* and *recommended* BMPs.

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

- Eliminate all use of bulk elemental mercury.
- Use only precapsulated dental amalgam.
- Any bulk mercury must be recycled or hauled away as hazardous waste.
- Bulk mercury must never be placed into the regular trash, in with infectious waste, or down the drain.

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

- Limit amount of amalgam used to smallest appropriate size for each restoration.
- Keep a variety of amalgam capsule sizes on hand.

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

- Change or clean chairside amalgam traps frequently.
- Flush the vacuum system before changing the trap.

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

Change vacuum pump filters
and screens at least once per
month or as directed by the
manufacturer.

Amalgam Waste:

- Contact amalgam (e.g., extracted teeth containing amalgam)
- Amalgam/sludge captured by chairside traps, vacuum pump filters, screens, etc.
- Non-contact amalgam (scrap)
- Used capsules visibly containing mercury
- Leaking or unusable capsules

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

- All amalgam waste must either be recycled (preferable) or hauled away as hazardous waste (acceptable).
- Amalgam waste must never be placed in regular trash, placed in infectious waste, or flushed down the drain.
- Traps, filters, or screens must never be rinsed over drains or sinks.

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

Store amalgam waste in covered, segregated, and clearly labeled airtight plastic containers or as directed by the recycler.

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

- Maintain a log of amalgam waste generation and recycling/disposal.
- Documentation must be obtained from recycler or waste hauler, kept on file, and made available to NEORSD upon request.

NEORSD Mandatory BMP for Dental Mercury Discharge Minimization

Train all staff that handles
or may handle mercury-
containing material in its
proper use and disposal.

Recommended BMP for Dental Mercury Discharge Minimization

Use, when appropriate, mercury-free alternatives to amalgam:

- Gold
- Composite resins
- Ceramic
- Porcelain
- Polymers
- Glass ionomer, etc.

Recommended BMP for Dental Mercury Discharge Minimization

- Clean or replace under-sink traps and sumps.
- Take care to avoid spillage of contents from plumbing parts.
- Remove sludge that may contain mercury, and have it recycled or hauled away as hazardous waste.

Recommended BMP for Dental Mercury Discharge Minimization

- Use disposable chairside amalgam traps in cuspidor and vacuum system.
- Have used disposable traps recycled or hauled away as hazardous waste.

Recommended BMP for Dental Mercury Discharge Minimization

- Maximize use of the high-speed suction system.
- Remove wet cuspidors from service during amalgam restoration/extraction procedures.

Recommended BMP for Dental Mercury Discharge Minimization

Avoid using sodium
hypochlorite (bleach) to
disinfect vacuum lines.

Recommended BMP for Dental Mercury Discharge Minimization

- Be knowledgeable about amalgam separators employing enhanced sedimentation, fine particle filtration, and/or other technologies.
- Install and properly maintain such technologies that are determined to be feasible and effective.

Annual Report on BMP Implementation Status

- Submittal to NEORSD required by March of 2003 and each year thereafter.
- Any monitoring results
- Any information indicating BMP effectiveness
- Any updates to BMP plan
- Copies of hauling documentation, etc.

NEORSD Dental Mercury Program History

- 1997 – Assisted in planning of Ohio Dental Association (ODA) statewide bulk mercury collection and recycling program.
- 1998 – Served as drop-off site, collecting 103 pounds of bulk mercury for ODA program.

NEORSD Dental Mercury Program History

- May 1998 – Conducted mercury regulation/disposal seminar at NEORSD for dentists with cooperation from ODA and Greater Cleveland Dental Society.
- September 1998 – Conducted seminar at ODA Annual Conference in Columbus.

NEORSD Dental Mercury Program History

- Fall 1998 – Authored article on mercury regulation/disposal published in the Greater Cleveland Dental Society Bulletin.
- Winter 2001 – Budgeted for two new NEORSD investigators to be devoted to mercury issues, including dental office visits, etc.

NEORSD Dental Mercury Program History

- February 2002 – Meeting to inform ODA and Greater Cleveland Dental Society leaders of impending administrative order issuance and to obtain their input on BMPs.
- March 2002 – Obtained ODA list of mercury recyclers and Ohio Dental Board list of area dentists.

NEORSD Dental Mercury Program History

March 2002 – At dental administrative order issuance, began series of free seminars for dentists at NEORSD with continuing education credits provided by Greater Cleveland Dental Society.

Who's Next?

- Significant Industrial Users now required to self-monitor for mercury.
- Hospitals to be issued administrative orders requiring BMP plans.
- Medical clinics
- Analytical laboratories
- Schools
- Household thermometer exchange